

Figure :1 Perspective View

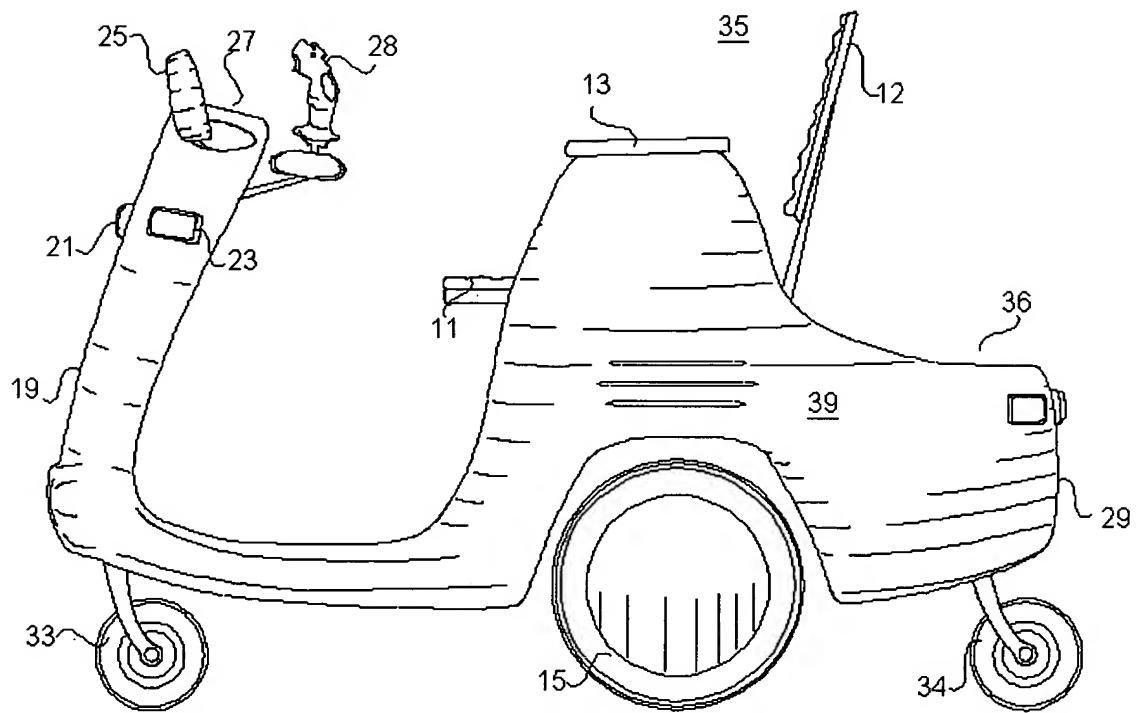


Figure 2: Side View

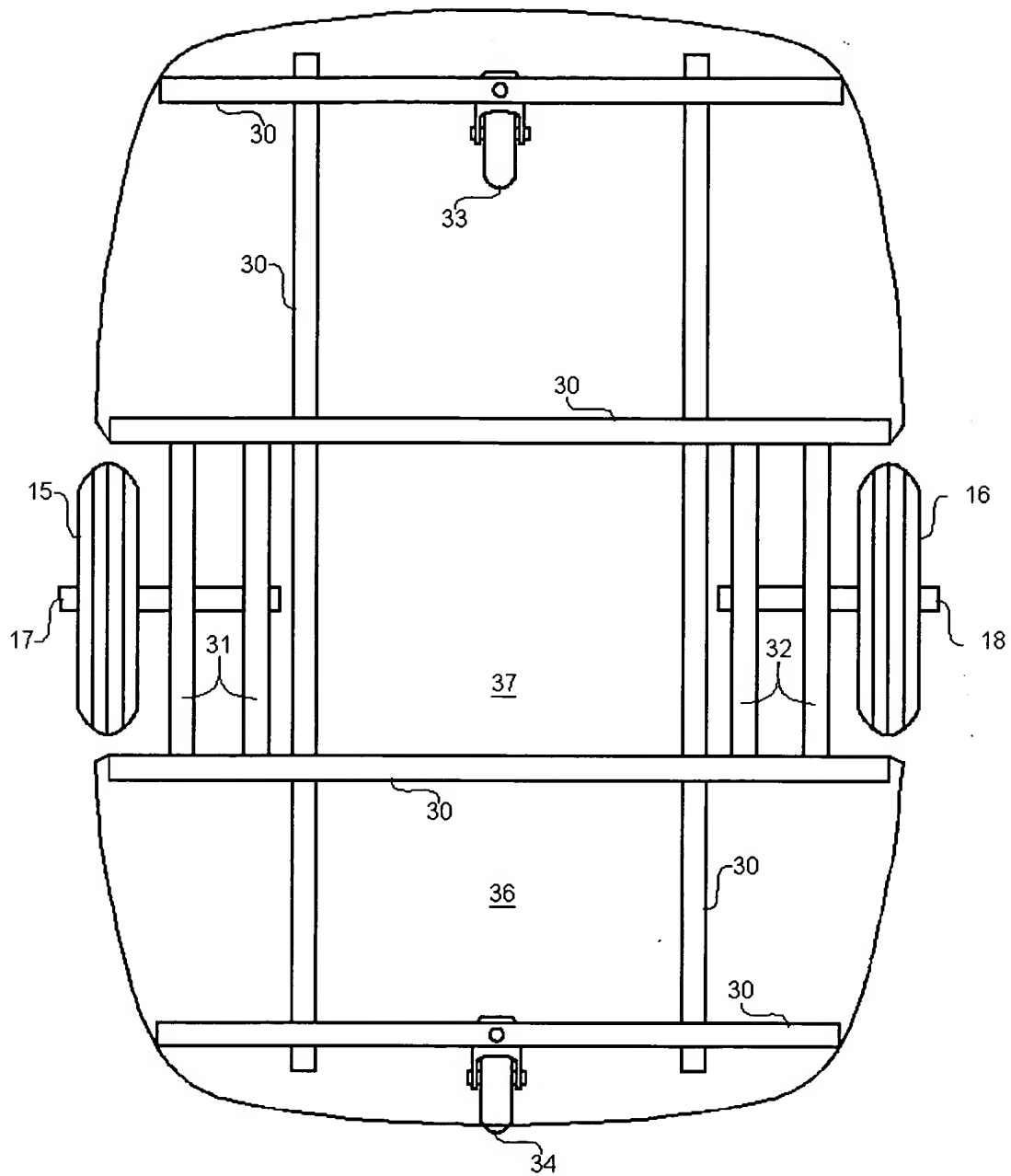


Figure 3 : Plan view of the chassis frame

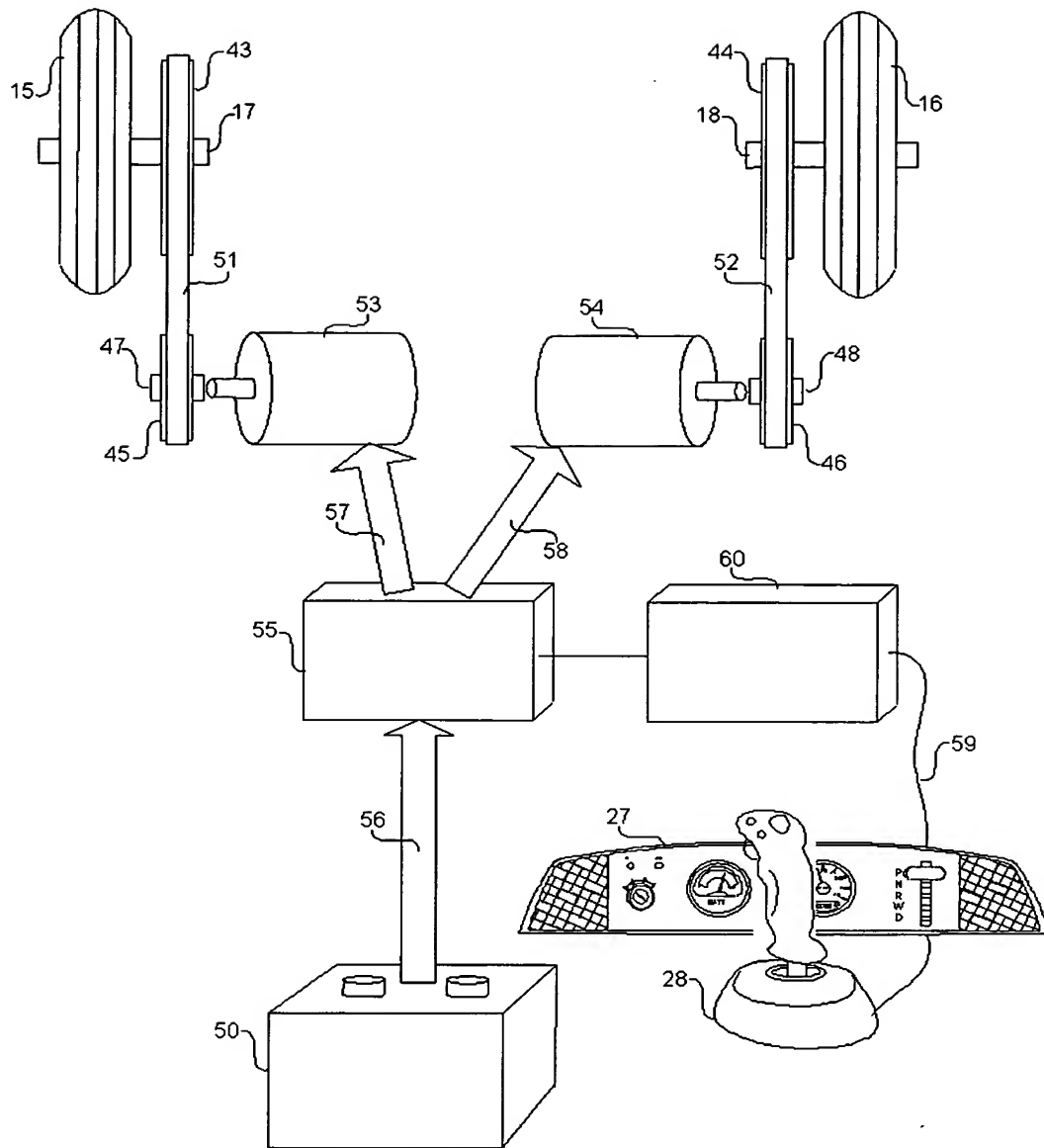


Figure 4 : The drive system

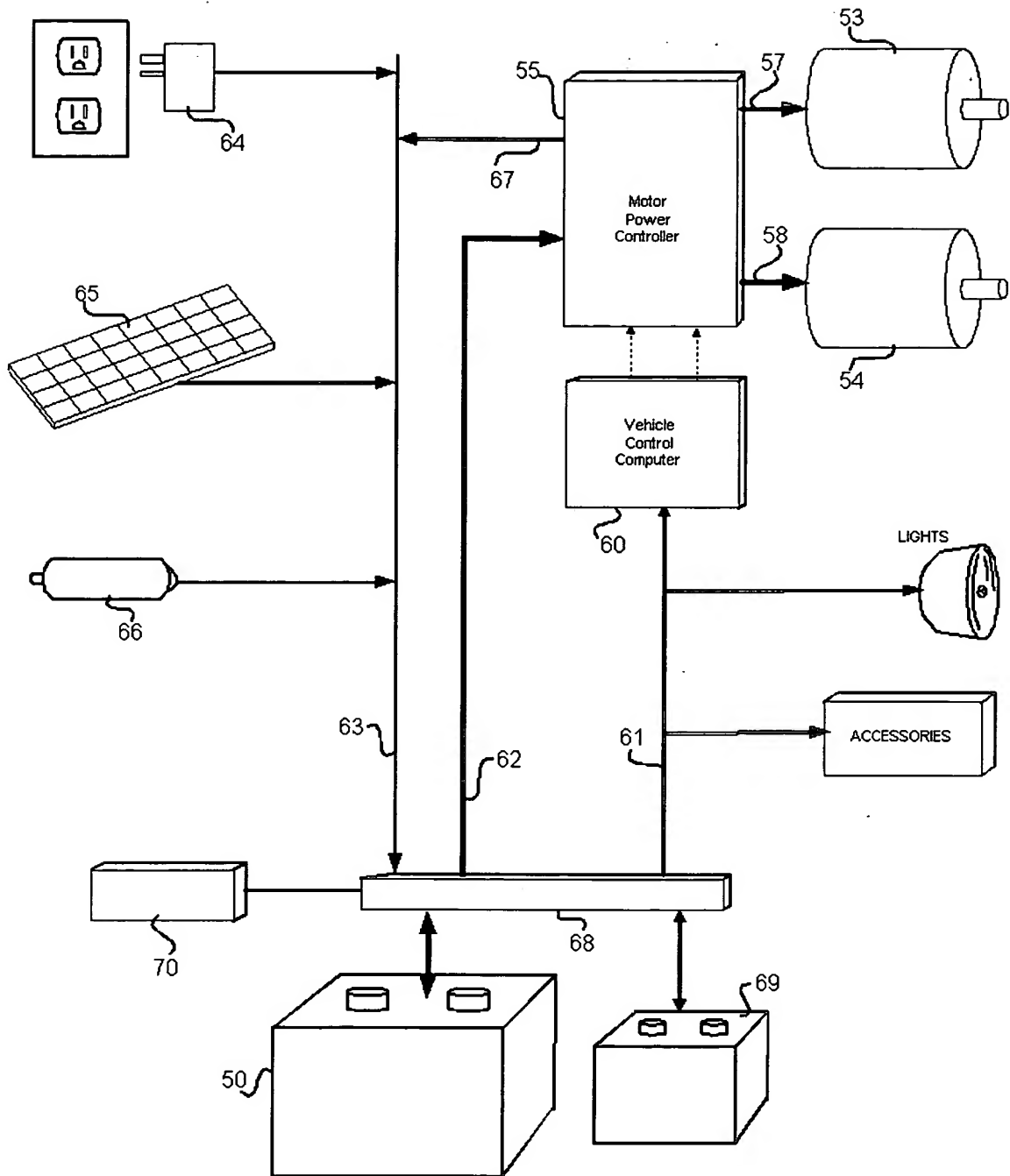
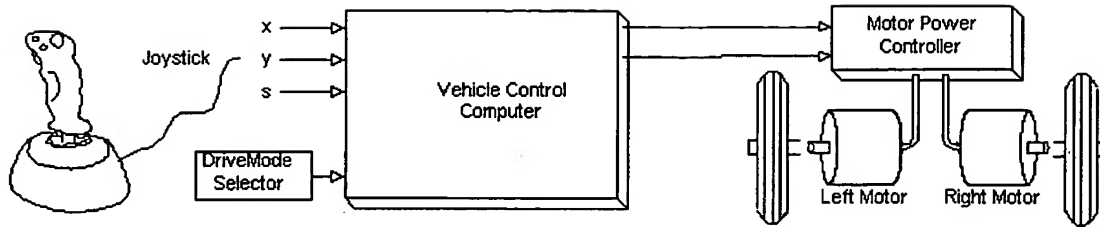


Figure 5 : Electrical System



| INPUT | | | | OUTPUT | | | |
|---------------|----------|----|----|---------------------------------|--------------|------------|-------------|
| Drive Mode | Joystick | | | NOTES | L to R Ratio | Left Motor | Right Motor |
| | x | y | s | | | | |
| Park | I | I | I | Wheels Locked | I | 0 | 0 |
| Neutral | I | I | I | Wheels unlocked | I | I | I |
| Drive Fwd | 0 | 0 | I | No Motion | - | 0 | 0 |
| | +X | 0 | I | Straightline Forward Motion | 1:1 | F | F |
| | +X | +y | I | Turn Right in Motion | 1<1 | F | F |
| | +X | -Y | I | Turn Left in Motion | <1:1 | F | F |
| Reverse | -X | I | I | Brake applied, Stop | 1:1 | 0 | 0 |
| | 0 | 0 | I | No Motion | - | 0 | 0 |
| | -X | 0 | I | Straightline Reverse Motion | 1:1 | R | R |
| | -X | +y | I | Turn Right in Reverse | 1<1 | R | R |
| | -X | -Y | I | Turn Left in Reverse | <1:1 | R | R |
| | +X | I | I | Brake applied, Stop | 1:1 | 0 | 0 |
| Weave: Fwd | 0 | 0 | I | No Motion | - | 0 | 0 |
| | +X | 0 | I | Straightline Forward Motion | 1:1 | F | F |
| | +X | +y | I | Turn Right in Forward | 1<1 | F | F |
| | +X | -Y | I | Turn Left in Forward | <1:1 | F | F |
| Rev | -X | 0 | I | Straightline Reverse | 1:1 | R | R |
| | -X | +y | I | Turn Right in Reverse | 1<1 | R | R |
| Spin R | 0 | 0 | +S | Spin Right on the spot | 1<1 | F | R |
| | 0 | 0 | -S | Spin Left on the spot | <1:1 | R | F |
| | 0 | 0 | 0 | If released, forced gentle stop | - | 0 | 0 |

- Comments:
1. "I" denotes irrelevant, x, y, s are signed values from Joystick, "F" denotes Forward, "R" denotes Reverse
 2. In Reverse Mode, handling speed is reduced for safety. In Weave Mode Speed is further reduced.
 3. Weave:Spin can be also used in combination of Forward, Reverse motion

Figure 6 : Joystick Motion control relations

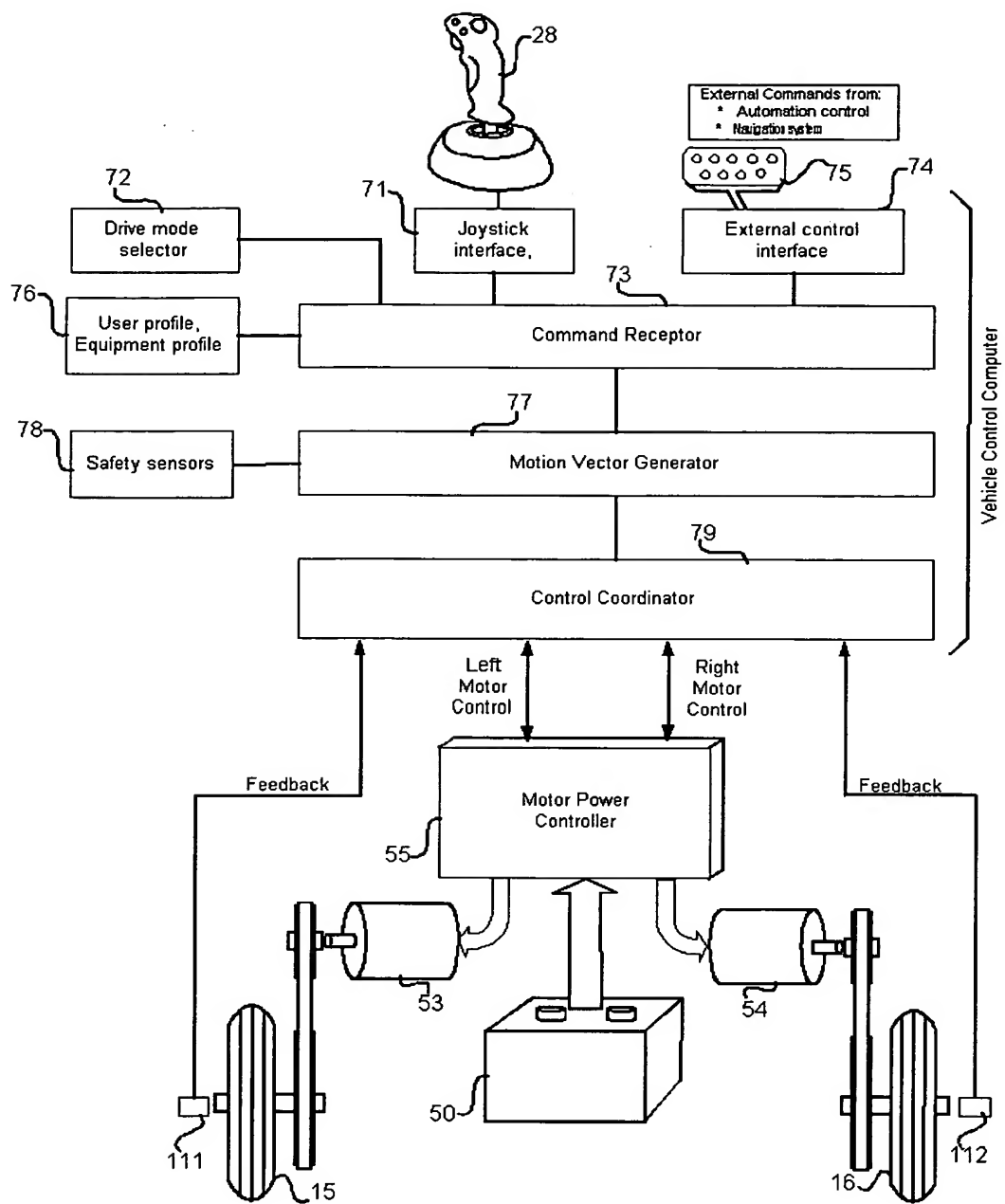


Figure 7 : Motion control block in operation

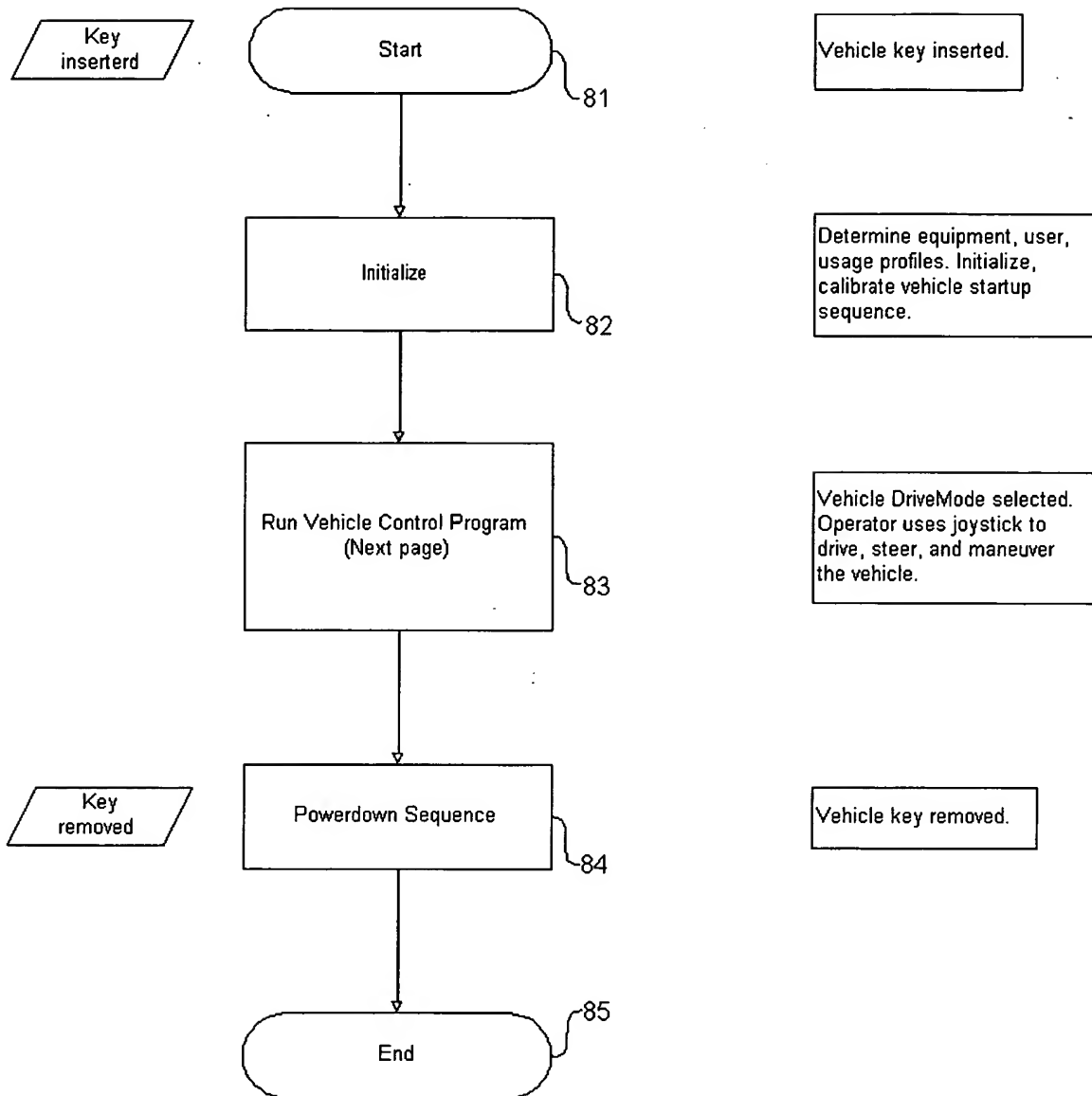


Figure 8 : Driver Operation Sequence

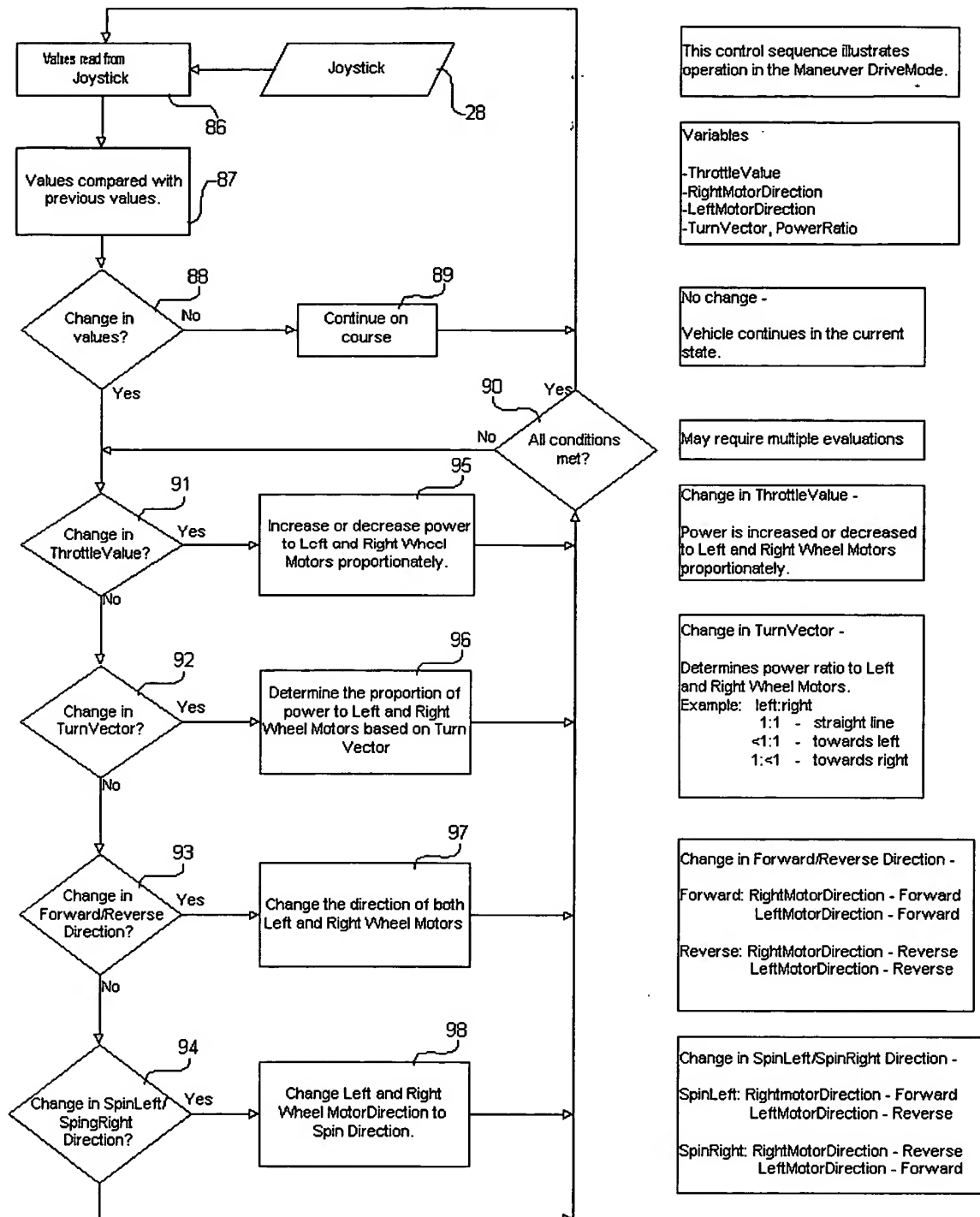


Figure 9 : Internal control flow in operation

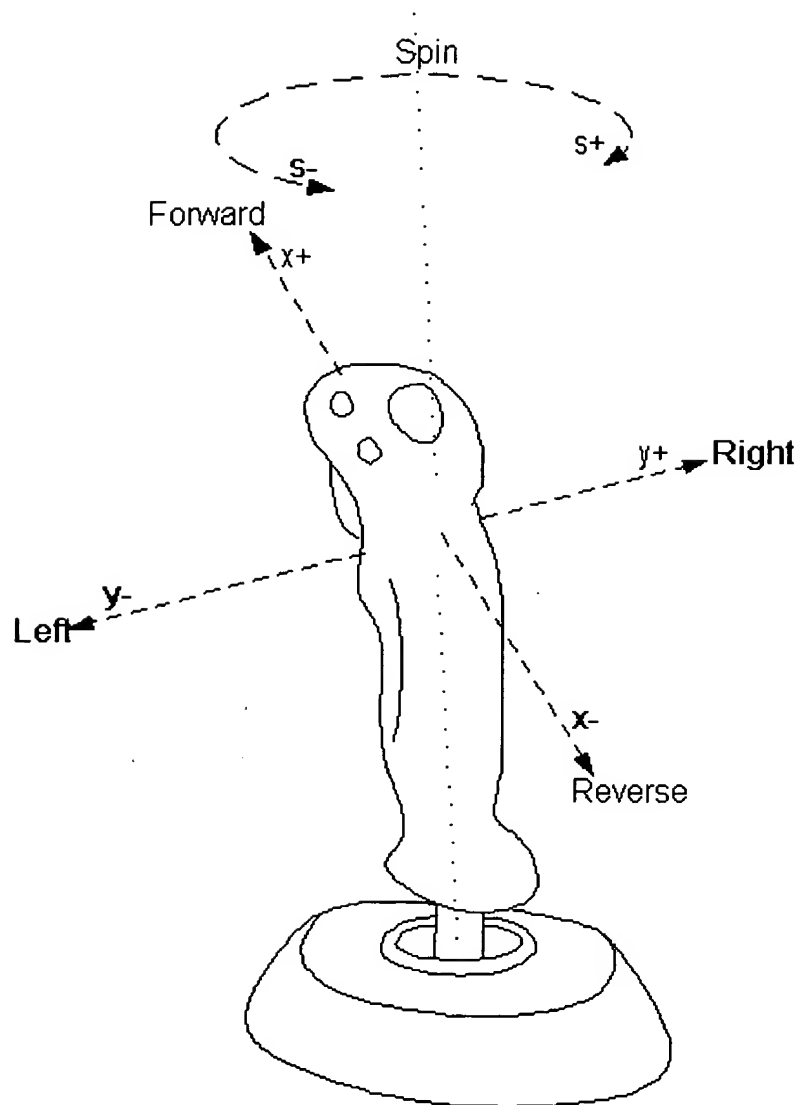


Figure 10 : Joystick motion control reference axes

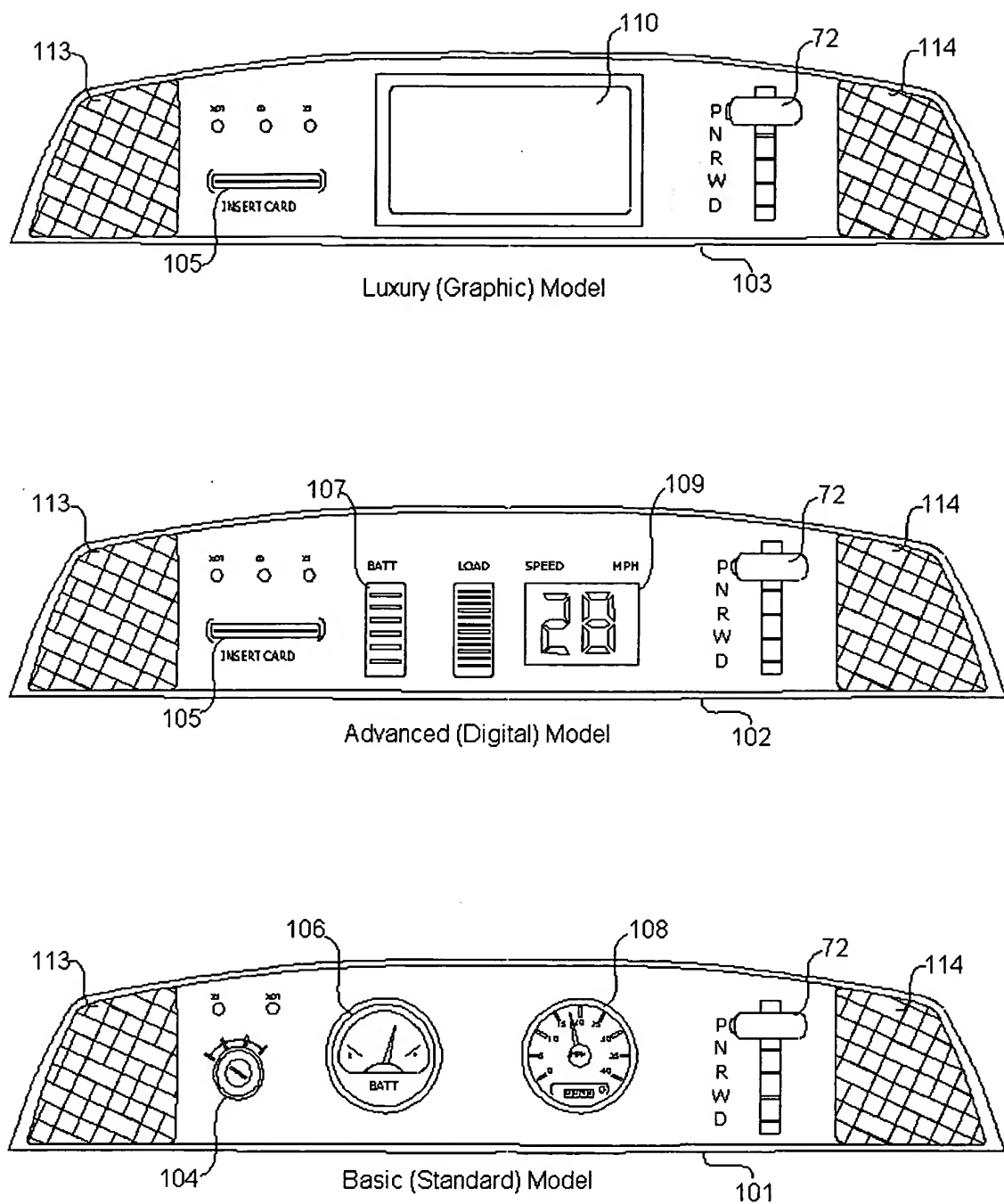


Figure 11 : Dashboard designs

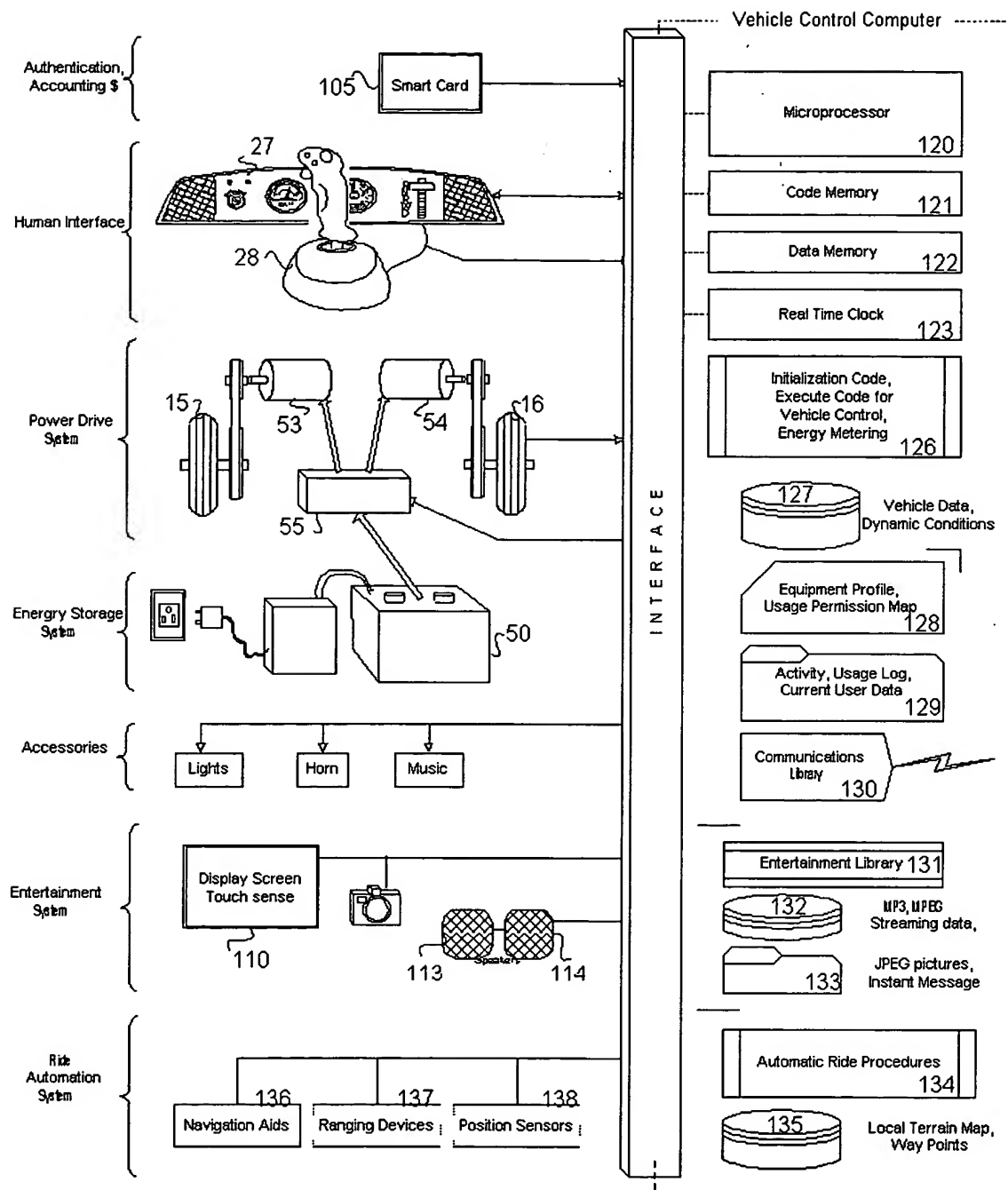


Figure 12 : Vehicle Control Computer

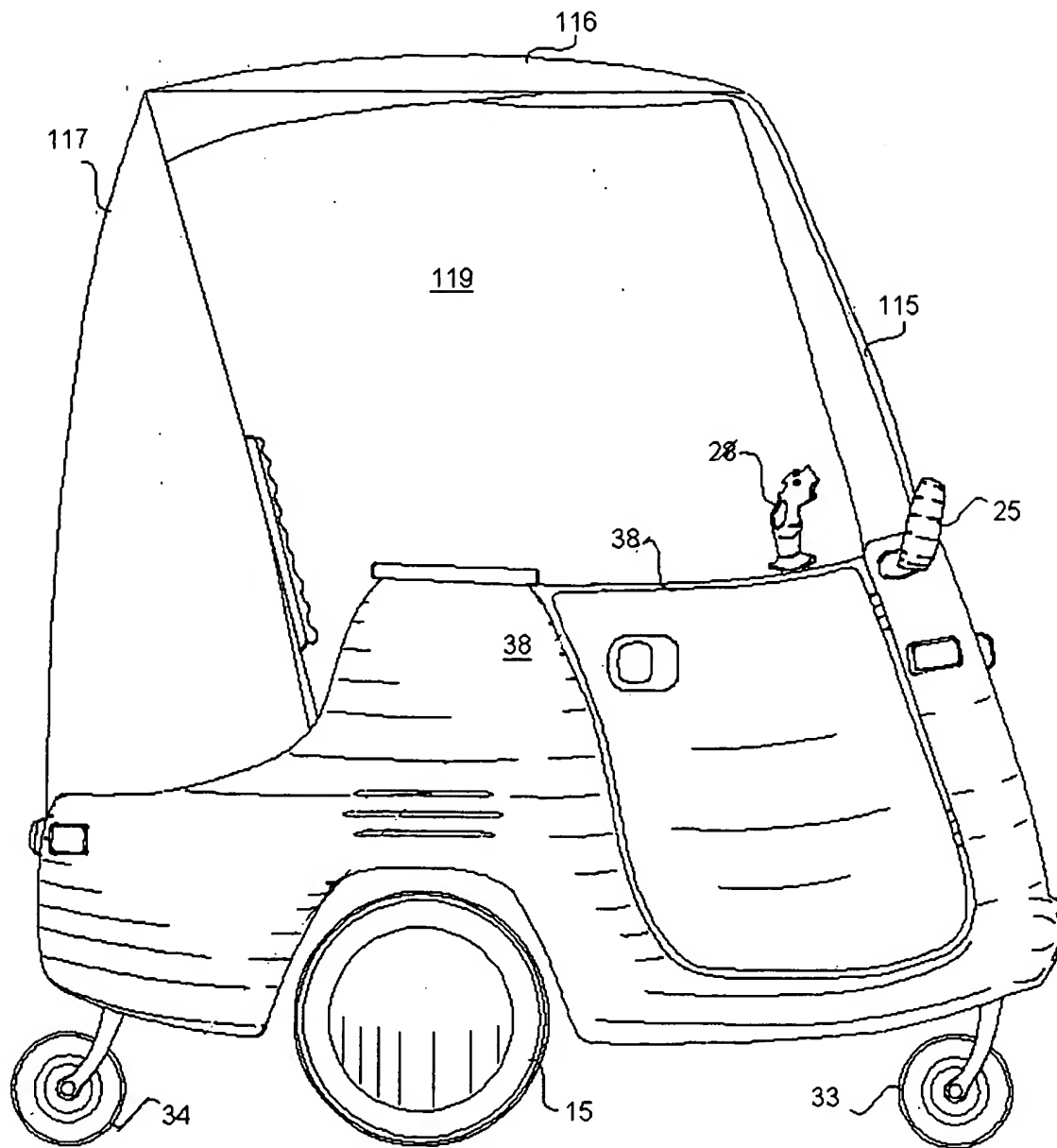


Figure 13 : Side View of an embodiment with hood.